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# SEABROOK HARBOR BEACH

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Water Quality Report  
Summer 2008



**Seabrook Harbor Beach, Seabrook  
Water Quality Report  
Summer 2008**



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**Table of Contents**

History of the Beach Program ..... 4  
Beach Statistics..... 5  
Assessing Your Beach ..... 6  
Sampling Frequency and Location..... 6  
Coastal Water Quality Standards and 2008 Results ..... 8  
Concerns..... 10  
Future Projects..... 10

**List of Figures**

Figure 1. Seabrook Harbor Beach Access Points and Restroom Facilities. .... 5  
Figure 2. Seabrook Harbor Beach Monitoring Stations. .... 7  
Figure 3. Seabrook Harbor Beach 2008 Enterococci Data..... 9

**List of Tables**

Table 1. Seabrook Harbor Beach Station Descriptions and Latitude/Longitude Points... 7

**Appendices**

Appendix A: 2008 Special Report – Stormwater Modeling..... 11  
Appendix B: Seabrook Harbor Beach 2008 Data by Date..... 12

## History of the Beach Program

The New Hampshire Department of Environmental Services (DES) recognizes a public health threat may exist within recreational waters and tests the water at the state's beaches to ensure swimmers are not exposed to disease-causing pathogens or cyanobacteria scums. The DES has operated a Public Beach Inspection Program, commonly called the Beach Program, for over 20 years.

The New Hampshire coastal beach monitoring program was initiated in 1989 with the DES inspecting five beaches. In October 2000, the United States Congress amended the Clean Water Act to include the BEACH Act. The Environmental Protection Agency (EPA) could now was now authorized to award grants to eligible states to develop and implement monitoring and notification programs. These programs protect the public from exposure to pathogenic microorganisms in coastal recreation waters.

The DES first received grant funds in 2002. Since then the New Hampshire Beach Program has successfully met all of EPA's performance criteria requirements (*National Beach Guidance and Required Performance Criteria for Grants*) and continues to expand the monitoring and notification program. Weekly summer monitoring throughout the state was conducted at nine beaches in 2002, and has since doubled to 16 by 2008. The Beach program strives to expand sampling to include all coastal New Hampshire beaches.

Coastal beaches are monitored for the presence of the fecal bacteria *Enterococci* which are present in the intestines of warm-blooded animals including humans. Fecal bacteria, when present in high concentrations and ingested, can commonly cause gastrointestinal illnesses such as nausea, vomiting and diarrhea. These indicator organisms signify the possible presence of other potentially disease-causing organisms in the waterbody.

Beach monitoring and bacteria source tracking have been implemented to protect public health. In a collaborative effort, the DES Beach program, towns, beach managers, recreational directors and health inspectors encourage public awareness of sources of pollution and environmental responsibilities. Thank you for your interest and concern in New Hampshire's water quality.

## Beach Statistics

Seabrook Harbor Beach, located on the west side of Ocean Boulevard, is owned and maintained by the town of Seabrook.

Seabrook Harbor Beach is a 787-foot long sandy beach. The beach is used by the public for fishing and other recreational activities. There are 41 access points to the beach area from the parking lot and surrounding neighborhood (Figure 1). Lifeguards are not present throughout the summer, but toilet facilities are available.

Waterfowl are frequently observed at the beach. The most commonly observed waterfowl are gulls, although plovers are observed occasionally as well. There are restrictions for dogs on the beach; Beach Inspectors did not observe any domestic animals during inspections.



**Figure 1. Seabrook Harbor Beach Access Points and Restroom Facilities.**

## **Assessing Your Beach**

### **Sampling Frequency and Location**

The Beach Program developed a risk-based beach evaluation process and tiered monitoring approach during the 2003 beach season based on the EPA performance criteria. Beaches are evaluated annually to determine potential health threats to the public. Evaluations are based on several criteria within three main categories: beach history, microbial pathogen sources, and beach use. Beaches are now assessed as impaired for bacteria based on the most recent version of the Consolidated Assessment and Listing Methodology (CALM). The CALM assesses beach units as impaired based on historical exceedances of both the single sample and geometric mean bacteria standards. This report is submitted to EPA every two years.

Based on the evaluations, beaches are assigned a Tier I, Tier II, or Tier III status. Tier I beaches are considered “high priority” and have an increased potential to affect public health. Tier II beaches are “medium priority” and Tier III are “low priority” beaches that have less potential to affect public health. Beach sample frequency is based on Tier status; Tier I beaches are sampled twice per week, Tier II beaches are sampled once per week, and Tier III beaches are sampled every other week.

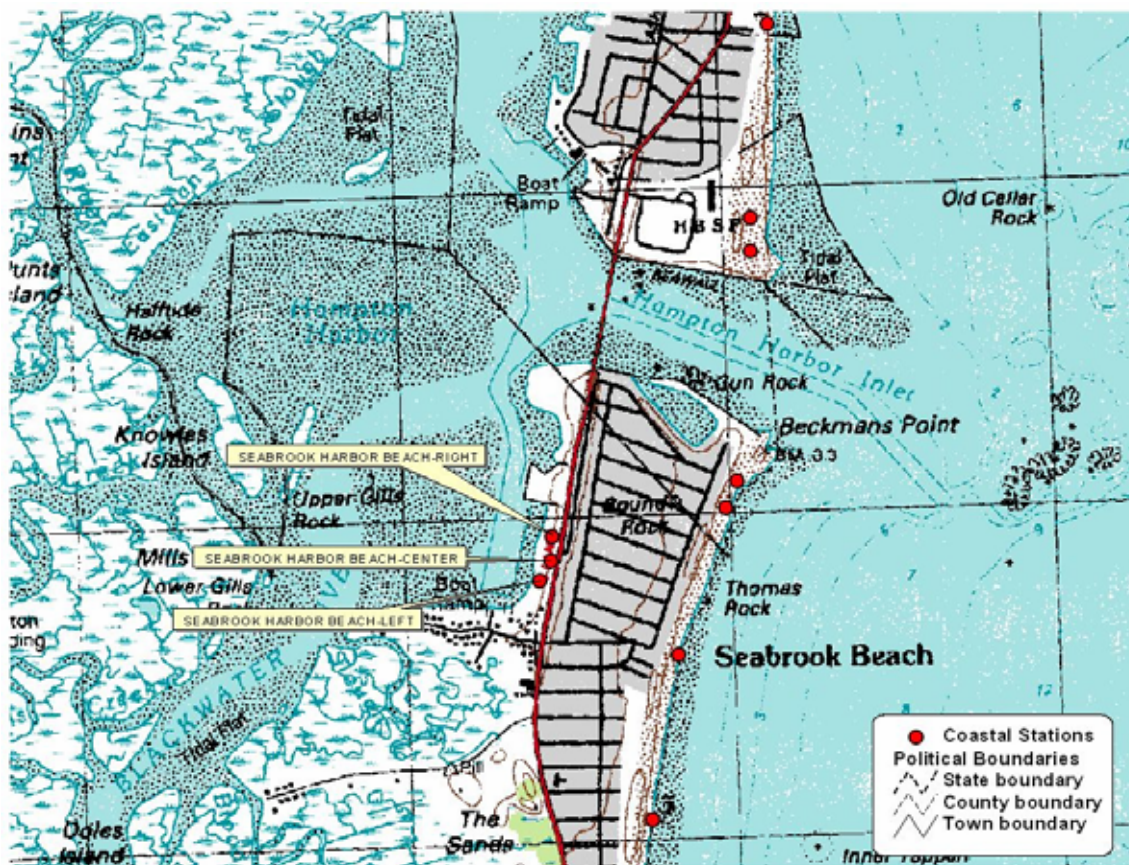
The number of samples collected at each beach is determined by the beach length. Beaches less than 100 feet in length are sampled at left and right locations one-third of the distance from either end of the beach. Beaches greater than 100 feet in length are bracketed into thirds and sampled at left, center and right locations. Routine sample collection may be enhanced by sampling known or suspected pollution sources to the beach area. Storm event sampling may be conducted at beaches where watershed runoff resulting from rainfall is expected to impact beach water quality.

Seabrook Harbor Beach is a Tier I beach indicating high priority, necessitating sampling twice each week. The frequency of sampling at Seabrook Harbor has changed since the launch of the beach evaluation process implemented in the 2003 sampling season. The beach increased from being sampled once every other week to being sampled once a week in 2004 due to increased data about the beach and potential bacteria sources. Sampling frequency changed again in 2006, when the beach was reclassified as an impaired beach, largely due to an advisory in 2005. Since 2006, Seabrook Harbor has been sampled twice each week throughout the summer. At Seabrook Harbor Beach, samples are collected at the left, center, and right stations regularly (Table 1). All stations are evenly distributed along the shoreline (Figure 2) and can be accessed via the parking lot (Figure 1).



**Table 1. Seabrook Harbor Beach Station Descriptions and Latitude/Longitude Points.**

Station Description	Latitude	Longitude
<b>Left Sample Station:</b> Located south of the restrooms and a sign that reads "No Bus or Camper Parking". There is a path next to the sign to access the beach area.	42° 53' 18.3092"	-70° 49' 8.9922"
<b>Center Sample Station:</b> Between the main beach entrance and the restroom facilities, there is a path to access the beach between the fifth and sixth wooden post south of the main beach entrance.	42° 53' 20.3157"	-70° 49' 7.4179"
<b>Right Sample Station:</b> Located to the north of the main beach entrance and north of a sign that reads "No Fishing (etc)...from beach". There is a path to access the beach area to the right of the sign.	42° 53' 22.7551"	-70° 49' 7.2673"



**Figure 2. Seabrook Harbor Beach Monitoring Stations.**

## **Coastal Water Quality Standards and 2008 Results**

Beaches are monitored to ensure compliance with State water quality standards. Marine waters are analyzed for the presence of the fecal bacteria *Enterococci*. *Enterococci* are known as indicator organisms, meaning their presence may indicate the presence of other pathogenic organisms. The State standard for *Enterococci* at public beaches is 104 counts/100 mL in one sample, or a geometric mean of 35 counts/100 mL in at least three samples collected over sixty days. When samples exceed the standard, a beach advisory is issued, at which point the beach manager is notified and signs are placed at the entrances to the beach to warn the public of the potential health threat posed by water contact at the beach. Beach advisories remain in effect until subsequent beach sampling indicates safe water quality conditions.

The 2008 sampling season began May 27th. The sampling season encompassed 96 days. Precipitation was recorded on 32 days over the summer (based on Seabrook Power Station recorded precipitation). June wetfall totaled 1.85 inches while July and August yielded 4.48 and 3.26 inches of rain respectively.

At Seabrook Harbor Beach, 28 routine inspections were conducted during the summer of 2008, with four additional inspections taking place in September. Ninety-six samples were collected and tested for *Enterococci* (Appendix B). Overall, the 2008 summer *Enterococci* levels were very low and within the State's standards for Seabrook Harbor (Figure 3), with no advisories issued. On August 11, *Enterococci* levels were slightly raised at the right sampling station, with a count of 60/100 mL. There is no indication of what may have caused bacteria levels to rise solely at this station. The next time the beach was sampled, the *Enterococci* count was within the state's standard for designated beaches. On September 10, Seabrook Harbor Beach experienced slightly high bacteria levels at the center station. This increase may likely be the result of runoff from 0.33 inches of wetfall in the 24 hours prior to sampling. Once the beach was re-sampled, all results indicated bacteria within the state standards.



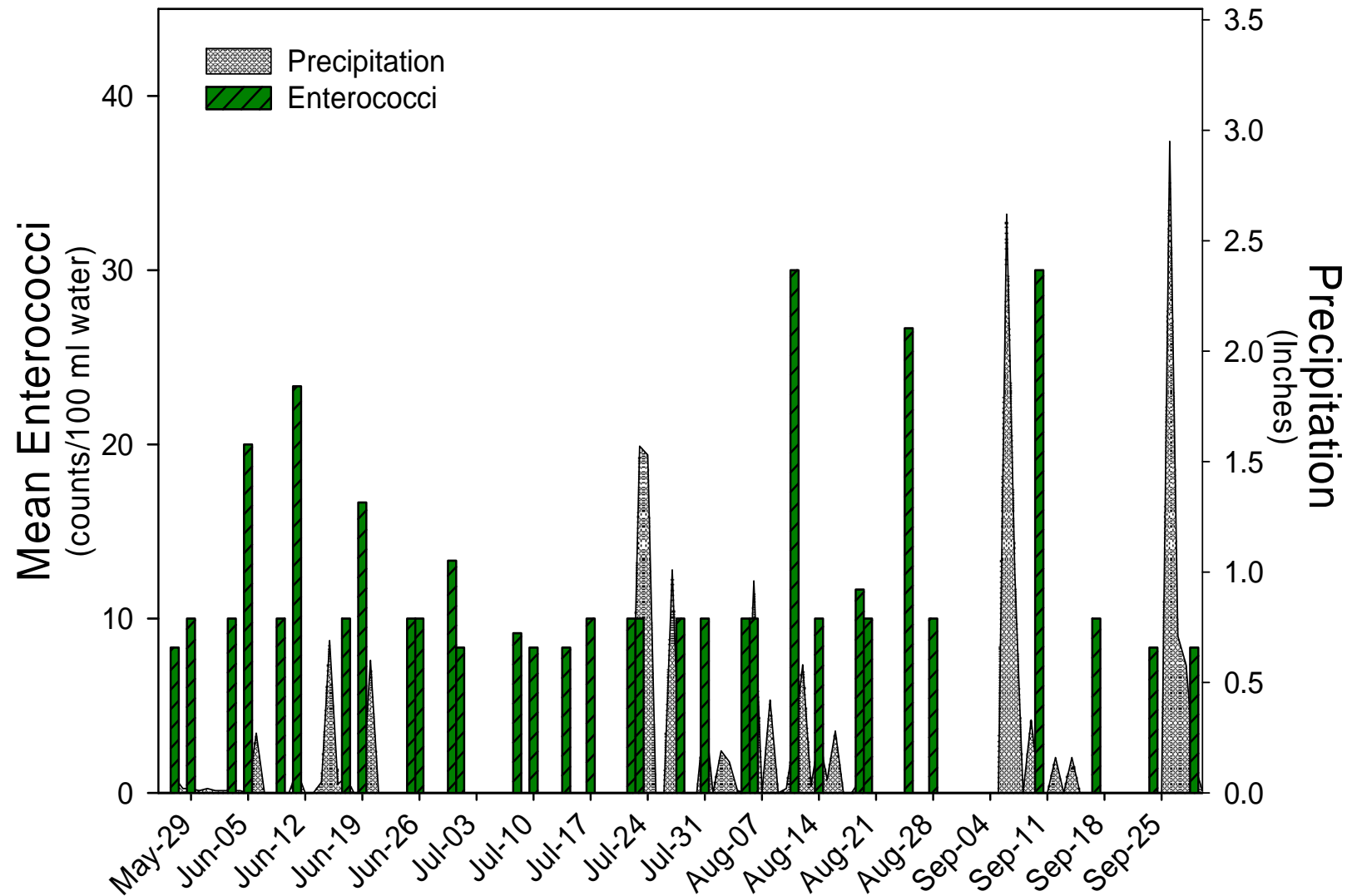


Figure 3. Seabrook Harbor Beach 2008 Enterococci Data. Enterococci values are the mean of the three collected beach samples. No advisories were posted at Sawyer Beach during the summer of 2008 for violations of the state standard of 104 counts/100 ml of water. Elevated July and September did not lead to increased bacteria values. See Appendix B for all results from all stations for the 2008 sampling season.

## Concerns

Fishermen were observed at Seabrook Harbor Beach on many occasions throughout the summer. Poor fishing practices may be a cause for concern. Dead fish were observed during at least three separate inspections over the course of the summer, including August 19, when eight carcasses were documented during a single inspection. Although there is no direct evidence that fish carcasses are a significant bacteria source to the beach, they certainly contribute to increased bacteria levels through decomposition and the influence of grazers upon the dead carcasses. Fishing lines and hooks are also a safety threat to swimmers and beach users.

Boats moored in the harbor also continue to be a concern. Between 10 and 20 boats were moored in the harbor during the 2008 beach season. Some boats contain onboard toilet facilities, and although discharging waste into the harbor is illegal, documented cases of sewer discharges have been recorded. The New Hampshire DES Shellfish Program has also expressed concerns about the threat that boat sewage poses to the shellfish beds in the harbor. If a boat is observed discharging to the harbor, please notify the DES, Clean Vessel Act Program, the Coast Guard, or Marine Patrol. There are sufficient boat pump-out facilities located along the coast and mobile pump-out boats where boat sewage can be pumped out in a safe and legal manner.

## Future Projects

- The DES Beach Program encourages participation between the Seabrook Beach Committee, local businesses, or school groups and the Adopt-a-Beach Program. The program promotes beach clean-ups and water quality monitoring. The DES would conduct training sessions and participate in education and outreach activities for the community.
- The beach area should be used for recreational purposes such as picnicking, swimming, or sun bathing. Consider increasing enforcement efforts against fishermen violating beach rules. Fishing lines and lures are dangerous to swimmers, while discarded fish parts likely increase bacteria levels and are a nuisance to beach goers.

If you are interested in more information on any of these future projects, please contact Sonya Carlson at (603) 271-0698 or [sonya.carlson@des.nh.gov](mailto:sonya.carlson@des.nh.gov).

## **Appendix A: 2008 Special Report – Stormwater Modeling**

When rain falls over the land, it flushes bacteria and other contaminants that have accumulated on the landscape to our beaches. As impervious areas like pavement and buildings are constructed in a subwatershed, more runoff contaminants are carried to our beaches. In addition to increased impervious cover as a result of land use changes, New Hampshire has recently experienced substantial and prolonged wetfall events. With increased flushing of the landscape combined with expanded impervious cover, it is imperative for local and state governments to explore new management techniques to protect New Hampshire beaches from contaminant sources.

DES Beach Program monitors New Hampshire coastal waters for potentially pathogenic bacteria. The DES has been monitoring these beaches since 1989 and has amassed large amounts of bacterial information for most coastal beaches. This collected information over the past years can be used to predict bacteria counts that can be expected with present and future development.

The DES Beach Program is proactive and always researching new management practices that can improve beach quality and new techniques to accelerate the beach advisory notification process. Beach Program personnel sample coastal beaches 4 days a week. Advisories are issued once state bacteria standards are exceeded. Despite our protective efforts, at least 24 hours pass from sample collection to bacteria count determination. During this time DES and swimmers are unaware of bacteria levels. The period of time between monitoring and sample analyses certainly put swimmers at risk for potential illness.

Two important Beach Program goals are to determine watershed contribution of bacteria to coastal beaches and to predict bacterial concentrations during and after a rain event. Mathematical models can be used to ascertain categories of bacteria sources and to predict bacteria concentrations after a rain event. Such models are complex and require a great deal of expertise and technical skill. The DES has selected FB Environmental to utilize an appropriate model and to train Beach Program personnel how to apply the model. With detailed predictions of how wetfall will affect bacteria transport to coastal beaches, future buildout planning, mediation, and construction could be guided by a stormwater model. The DES hopes the model will provide a useful tool for town officials and law makers to improve public notification and protect public health.

With the ability to predict public beach bacterial concentrations DES could immediately post an advisory based on predicted values and conduct follow up sampling for verification. A predictive model would allow advisories to be posted as soon as a public health threat occurs. Collecting samples during times of predicted high bacteria levels will help DES verify the accuracy and precision of the model. A model can be an effective tool in helping us achieve our mission to protect the public from exposure to waterborne illness while enjoying New Hampshire waters.

In addition to coastal bacteria data, the model will incorporate land use categories, hydrology, topography, historical precipitation records, historical tide data, and waste management. The data collection effort for this project has been time consuming and required help from several sources outside the DES. The DES would like to thank the National Oceanic and Atmospheric Association, the National Climatic Data Center, the Seabrook Nuclear Power Station and the Pease Air National Guard Base Weather Station for providing data. The model is only as good as the data we input, so we strive for the best quality controlled verified data available. The project is due for completion in early 2009.

## Appendix B: Seabrook Harbor Beach 2008 Data by Date

Date	Enterococci (count/100 mL)			Tide Height (feet)	Rainfall in previous 24 hours (inches)	Number of bathers	Animal Presence
	Left	Center	Right				
5/27/08	< 10	5	< 10	1.96	0	0	1 gull
5/29/08	< 10	< 10	< 10	5.13	0.01	0	2 gulls
6/3/08	< 10	< 10	< 10	6.97	0.01	0	10 gulls
6/5/08	20	30	< 10	2.14	0.01	0	1 gull
6/9/08	< 10	< 10	< 10	1.15	0	0	0
6/11/08	50	< 10	10	4.88	0.1	0	7 birds
6/17/08	< 10	10	< 10	6.38	0.11	0	0
6/19/08	30	10	< 10	3.87	0	0	5 gulls
6/25/08	< 10	< 10	< 10	0.99	0	0	20 gulls
6/26/08	< 10	< 10	< 10	0.86	0	0	0
6/30/08	10	< 10	20	8.92	0	0	5 gulls
7/1/08	< 10	5	< 10	9.1	0	0	0
7/8/08	< 10	< 10	< 10	0.08	0	2	0
7/10/08	< 5	< 10	< 10	2.4	0	0	5 birds
7/14/08	< 10	< 10	< 5	7.81	0	0	0
7/17/08	< 10	< 10	< 10	6.52	0	0	5 gulls
7/22/08	< 10	< 10	< 10	2.23	0	0	5 gulls
7/23/08	10	< 10	< 10	0.77	0	0	5 gulls, 10 plovers
7/28/08	< 10	< 10	< 10	6.05	1.0	0	2 gulls
7/31/08	< 10	< 10	10	9.13	0.01	0	0
8/5/08	< 10	< 10	10	1.35	0.01	0	20 gulls
8/6/08	< 10	< 10	< 10	0.93	0.45	0	20 gulls, dead fish
8/11/08	20	10	60	6.39	0.03	0	2 gulls
8/14/08	< 10	< 10	< 10	8.04	0.03	0	5 gulls, 6 plovers
8/19/08	20	10	< 10	4.2	0.06	0	20 gulls, dead fish
8/20/08	< 10	< 10	< 10	2.32	0.06	0	30 gulls, dead fish
8/25/08	20	30	30	3.27	0	0	10 gulls
8/28/08	< 10	< 10	< 10	8.89	0	0	0
9/10/08	10	70	< 10	5.86	0.33	0	30 gulls
9/17/08	< 10	10	10	2.57	0	0	17 gulls
9/24/08	< 10	< 10	< 5	7.39	0	0	75 gulls, 1 cormorant
9/29/08	< 10	< 10	< 5	9.99	0.37	0	35 gulls